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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/671,652 | 09/25/2003 | Elefterios Lidorikis | MIT.10001 | 1366 |

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| EXAMINER |
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KIANNI, KAVEH C

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| ART UNIT | PAPER NUMBER |
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2883

DATE MAILED: 06/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/671,652

Applicant(s)

LIDORIKIS ET AL.

Examiner

Kianni C. Kaveh

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 September 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4, 7-10, 13-16, 19-25, 30, 35 and 40 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 7, 8, 13, 14, 19, 20, 23-25, 30, 35 and 40 is/are rejected.
- 7) ☒ Claim(s) 3, 4, 9, 10, 15, 16, 21 and 22 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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DETAILED ACTION

- Applicant's canceling of claims 27, 29, 32, 34, 37, 39, 42 and 44 in the Amendment/response submitted on 3/30/06 is acknowledged.

Allowable Subject Matter

Claims 3-4, 9-10, 15-16, and 21-22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 3-4, 9-10, 15-16, 21-22 are allowable because the prior art of record, taken alone or in combination, fails to disclose or render obvious wherein said photonic crystal fiber comprises a Holey/Omniguide fiber in combination with the rest of the limitations of the base claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

- This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention

dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-2, 7-8, 13-14, 19-20, 23-25, 30, 35, and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eggleton et al. (US 6201916).

Regarding claims 1, 7, 13, 19, 23-24, and 30, Eggleton teaches a bandgap soliton structure and its method of forming (shown in at least fig. 8, see col. 3, 6th parag.; see col. 6, 2nd parag.) comprising: forming a cladding structure having alternating layers of different index values n_h, n_l (see fig., 8, item 83, and col., 9, line 66-col. 10, 1st parag.); and forming a core region that is interposed between said alternating layers of index values (see fig. 8, item 84), and comprises a modified core portion in which propagation of certain frequencies is not allowed (see at least col. 2, lines 59-64 and col. 6, 1st parag., wherein grating in the core reflects/filters out certain frequencies in which the core waveguide is of photonic band structure that excludes certain bands of frequencies) and includes one or more nonlinear materials (see at least col. 3, last parag.+), wherein said core or said cladding structure are arranged so as to achieve/enhance band-gap bistability structure (see at least col. 9, line 66-col. 10, 1st parag. and see at least fig. 3, item 33 for bistability) by introducing a modified portion in either of said cladding structure or said core region that comprises one or more non-linear materials so that propagation of certain frequencies is not allowed (see at least col. 2, lines 59-64 and col. 6, 1st parag., wherein

grating in the core reflects/filters out certain frequencies in which the core waveguide is of photonic band structure that excludes certain bands of frequencies; for nonlinearity of materials see at least col. 3, last parag.+), wherein the index of said one or more non-linear materials is less than the index of the alternating layers of either of said cladding structure or said core region (shown in fig. 5, items refractive indices of core-clad and nonlinear material *and see parag. 37 of detailed description*).

However, Eggleton does not specifically teach wherein the above bandgap soliton is gap-soliton structure. It is obvious/well-known to those of ordinary skill in the art when the invention was made that photonic bandgap structure having gaps in waveguide structure is/known-as gap-soliton structure since, motivation provided, such structure would provide optical bistability in a nonlinear waveguide structure.

Regarding claims 2, 8, 14, 20, Eggleton further teaches wherein said cladding structure and core region define a photonic crystal fiber (see col. 5, last parag.-col. 6, 1st para., wherein photonic silica glass is a photonic crystal); wherein said photonic crystal fiber comprises a Holey fiber (see at least page 516, 1st col., 1st parag.; see also page 18, 1st col., last parag.).

Regarding claim 25, 35, 40, Eggleton further teaches wherein said core performs single mode guiding of light (see at least page col., 5, lines 15-16).

Response to Arguments and Amendment

Applicant's argument filed on 3/30/06 have been fully considered but they are not persuasive.

In response to applicant assertion that Eggleton 'simply does not teach claimed limitations' without specifying which limitations, the examiner responds that indeed as stated above, except for claims 3-4, 9-10, 15-16, 21-22 Eggleton teaches all limitations of the *presently claimed* invention.

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Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to K. Cyrus Kianni whose telephone number is (571) 272-2417.

The examiner can normally be reached on Monday through Friday from 8:30 a.m. to 6:00 p.m. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank Font, can be reached at (571) 272-2415.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks
Washington, D.C. 20231

or faxed to:

(703) 872-9306 (for formal communications intended for entry)

or:

Hand delivered responses should be brought to Crystal Plaza 4, 2021 South Clark Place, Arlington, VA., Fourth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application should be directed to the Group Receptionist whose telephone number is (703) 308-0956.

**KAVEH KIANNI
PRIMARY EXAMINER**

K. Cyrus Kianni
Patent Examiner
Group Art Unit 2883



June 7, 2006